REMARKS

Claims 2-7 and 9-14 remain pending in this application for which applicants seek reconsideration.

Amendment

Claims 5, 7, 9, 12, and 14 have been amended to remove the informalities identified by the examiner and to overcome the § 112 rejection. In particular, the term --control-- has been added in claim 9 as suggested by the examiner. As to claims 5, 7, 12, and 14, they now recite that the first controller starts to drive all the scanners not being used for the image formation. Independent claims 2 and 9 also have been amended to clarify that the scanners are driven together at the same time. No new matter has been introduced.

§ 112 Rejection

Claims 5, 7, 12, and 14 were rejected under 35 U.S.C. § 112, second paragraph, because they contradict parent claims 2 and 9. The changes made to these claims correct this problem.

Art Rejection

Claims 2, 3, 9, and 10 were rejected under 35 U.S.C. § 102(b) as anticipated by Arai (USPGP 2002/0080220). Although the examiner did not explicitly mention claims 3 and 10 in this rejection, it appears that the examiner meant to include them in this rejection. Claims 4 and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Arai in view of Gomi (USP 6,314,251). Claims 6, 7, 13, and 14 were rejected under § 103(a) as unpatentable over Arai in view of Oda (USP 6,094,208). Applicants traverse these rejections because none of the applied references would have disclosed or taught causing a plurality of scanners for the first mode to be driven together at the same time while the image formation is being carried out in the second mode, as set forth in independent claims 2 and 9.

Each of independent claims 2 and 9 calls for controlling the scanners so that the scanners used for forming an image in the first mode, e.g., full color mode, are driven together at the same time while an image is being formed in the second mode, e.g., monochrome or black/white mode. These claims further call for switching to the first mode from the second mode, to carry out the image formation in the first mode, after the image formation in the second mode is completed.

Arai discloses a multicolor image forming apparatus having a first image forming unit 4K for forming a K toner image, second image forming units 4Y, 4M, and 4C, respectively forming a yellow toner image, a magenta toner image, and a cyan toner image, and a priority mode setting means 101 for setting a full color priority mode or a black and white priority mode. A user who frequently forms a full color image sets the priority mode setting means 101 to the full color priority mode, while a user who frequently forms a black and white image sets to the black and white priority mode.

In Arai, each image forming units 4Y, 4M, 4C, 4K has its respective exposure device 43Y, 43M, 43C, 43K, which includes a polygon mirror 434Y, 434M, 434C, and 434K for scanning and a laser light source. Referring to FIG. 4(a), in the full color mode, these polygon mirrors are driven at as follows. The polygon mirror 434Y is started first, after a prescribed time ΔT, the polygon mirror 434M is started, and after the prescribed time ΔT, the polygon mirror 434C is started, and further after the prescribed time ΔT, the polygon mirror 434K is started. See paragraph 51. After the rise time of t1-t2, each of the polygon mirrors reaches a constant rotational speed. After reaching the constant speed, the Y laser representing the laser light source of the exposure device 43Y for the Y image is driven at the time t3 to perform the writing of the Y image. The M laser, the C lasers, and the K laser are driven in the same manner as the Y laser, to perform the writing of the M image, the C image, and the K image.

Similarly, referring to FIG. 4(b), in the black and white printing, the polygon mirrors are initiated in the order of 434K, 434Y, 434M, and 434C. That is, the polygon mirror 434K is started first at t1. After the rise time of t1-t2, its rotation speed becomes constant. The laser light source of the exposure device 43K for the K image is driven at t3 to perform the writing after the polygon mirror 434K reaches the constant rotational speed. See paragraph 54.

The polygon mirror 434Y is started first for the full color image printing mode, whereas the polygon mirror 434K is started first for the black and white printing mode. In either mode, after the first started polygon mirror reaches the constant rotational speed after the rise time of t1-t2, the corresponding light source is driven at t3 to perform the writing of the corresponding image. Arai indeed discloses driving the polygon mirrors 434Y, 434M, and 434C used for the color image printing mode while in the black and white printing mode to achieve a ready-to-write state for color printing. See paragraph 55. Arai, however, drives the polygon mirrors sequentially one after another rather than driving them together at the same time as set forth in independent claims 2 and 9. Arai also would not have disclosed or taught switching to the first mode from the second mode, after the image formation in the second mode is completed. Arai

also would not have taught the synchronizing feature set forth in dependent claims 6, 13, and 14. For example, if the image formation mode for an N^{th} page is different from that for the $(N+1)^{th}$ page, the scanner preparation for the image formation of the $(N+1)^{th}$ page is started while the image formation of the N^{th} page is being carried out, and all the scanners are synchronized after the image formation of the N^{th} page. Arai simply would not have taught such features.

Gomi provides a tandem type image forming apparatus for solving the smearing problem in the photosensitive members of the image forming sections of the colors other than black during the monochromatic mode, and for preventing the photosensitive member of the image forming section of the color with which no image is formed from being excessively deteriorated during the monochromatic mode. See column 10, lines 47 to 67. Gomi simply would not have alleviated Arai's shortcomings noted above.

Oda provides a color image forming apparatus for solving the problems of the life, noise, and power consumption of the motors and for reducing the time for the first copy to thereby improve work efficiency. Specifically, the polygon mirror 82d for recording black color component, which is used more frequently, is kept in a waiting mode with its speed of rotation at the predetermined rate while the polygon mirrors 82a, 82b, and 82c for recording other color components are kept in a waiting mode with them stopped. See column 13, lines 28 to 34. Accordingly, when the polygon mirrors are synchronized with each other for color copying, from the state in which the polygon mirror 82d for recording black color component is kept at the predetermined speed of rotation, it is possible to correct the time lags of the signals from BDs 88a, 88b, and 88c, based on the signal from BD 88d for black recording, which has been already rotating at the stabilized speed. See column 13, lines 35 to 40. Oda, however, also does not disclose or teach driving the polygon mirrors used for the color mode together at the same time while in the black and white mode. Oda thus would not have alleviated Arai's shortcomings noted above.

Conclusion

Applicants submit that claims 2-7 and 9-14 patentably distinguish over the applied references and are in condition for allowance. Should the examiner have any issues concerning this reply or any other outstanding issues remaining in this application, applicants urge the examiner to contact the undersigned to expedite prosecution.

Respectfully submitted,

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DATE

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